

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently amended): A transportable heat storage unit, comprising:

a heat storage body which stores heat by a change in state change of said heat storage body from a solid state to a liquid state;

a heat exchange medium which exchanges heat by directly contacting said heat storage body,

said heat exchange medium has a smaller specific gravity than a specific gravity of said heat storage body when said heat storage body is in said solid state,

said heat exchange medium and is separated by phase from said heat storage body when said heat storage body is in said solid state; a phase boundary exists between said heat exchange medium and said heat storage body when said heat storage body is in said solid state;

a transportable heat storage container that houses the heat storage body and the heat exchange medium;

a supply pipe that passes through at least a portion of said heat storage body when said heat storage body is in said solid state, said supply pipe adapted for feeding housed in said storage container and supplies and releases said heat exchange medium into the storage container; and

a discharge pipe that discharges said heat exchange medium housed in said storage container to the outside of said storage container,

wherein said supply pipe crosses a boundary surface between said heat exchange medium and said heat storage body said phase boundary when said heat storage body is in said solid state,

said supply pipe comprising housed in said storage container and has a plurality of discharge holes that discharge said supplied heat exchange medium, and said supply pipe configured to have at least one of said discharge holes in fluid contact with an amount of heat exchange medium present in said heat storage container is positioned inside said heat exchange medium,

a discharge pipe adapted for discharging said heat exchange medium housed in said storage container to the outside of said storage container, wherein at least a part of said discharge pipe extends in a horizontal direction,

said heat storage container having wherein a first connection an inlet port of said supply pipe is positioned above a second and a discharge connection port of said discharge pipe, and

wherein the first connection said inlet port and said discharge port the second connection port are configured to connect the heat storage unit with a heat exchanger.

2. (Currently amended): The transportable heat storage unit according to Claim 1, wherein said supply pipe crosses vertically to said boundary surface phase boundary.
3. (Currently amended): The transportable heat storage unit according to Claim 2, wherein said supply pipe is disposed coaxially around a circumference of an area having said discharge holes and has a circulation pipe to allow said heat exchange medium discharged from said discharge holes to go up in a vertical direction.
4. (Currently amended): The transportable heat storage unit according to Claim 1, wherein at least a part of said supply pipe extends in a horizontal direction, and said discharge holes are provided for an area extending in the horizontal direction such that the holes are open in the vertically downward direction.
5. (Currently amended): The transportable heat storage unit according to Claim 1, wherein in said heat storage body, said supply pipe has an expanded portion that is in a shape that widens toward an end and provided with said discharge holes on a bottom surface.
6. Canceled.
7. (Currently amended): The transportable heat storage unit according to Claim 1, further comprising:

a plurality of wave-absorbing plates that are arranged in parallel with each other along the ~~boundary surface~~ phase boundary between said heat storage body and said heat exchange medium and arranged vertically to have a portion of at least one of said wave-absorbing plates crossing said ~~boundary surface~~ phase boundary, ~~and prevents agitation on said boundary surface~~.

8. (Currently amended): The transportable heat storage unit according to Claim 1, wherein said discharge pipe includes a separation mechanism that separates said heat storage body and said heat exchange medium.
9. (Currently amended): The transportable heat storage unit according to Claim 8, wherein said separation mechanism has a separator for allowing said heat exchange medium and said heat storage body, which were taken in, to flow horizontally in one direction and a discharge hole that discharges said heat storage body, which is being precipitated, from said separator, and

said separator has a shape for guiding said precipitated heat storage body toward said discharge hole.
10. (Currently amended): The transportable heat storage unit according to Claim 1, wherein said heat storage body is erythritol.
11. (Currently amended): A transportable heat storage unit, comprising:

a heat storage body which stores heat by a state change in state from a solid state to a liquid state;

a heat exchange medium which exchanges heat by directly contacting said heat storage body,

said heat exchange medium has a smaller specific gravity than a specific gravity of said heat storage body when said heat storage body is in said solid state, and is separated by from said heat storage body when said heat storage body is in said solid state;

a transportable heat storage container that houses the heat storage body and the heat exchange medium;

a supply pipe that passes through at least a portion of said heat storage body when said heat storage body is in said solid state; said supply pipe adapted for feeding ~~housed in said storage container and supplies and releases~~ said heat exchange medium into the storage container; and

a discharge pipe adapted for discharging that ~~discharges~~ said heat exchange medium housed in said storage container to the outside of said storage container,

wherein said supply pipe includes:

a first supply pipe having discharge holes that which can discharge said supplied heat exchange medium into said heat storage body; and

a second supply pipe that crosses a phase boundary surface between said heat exchange medium and said heat storage body when said heat storage body is in a solid state, ~~which are housed in said storage container~~, and has an outlet that can discharge a ~~discharges said supplied~~ heat exchange medium feed into the heat exchange medium present in said storage container,

wherein at least a part of said discharge pipe extends in a horizontal direction,

wherein a first connection port of said supply pipe is positioned above a second connection port of said discharge pipe, and

wherein the first connection port and the second connection port are configured to connect the heat storage unit with a heat exchanger.

12. (Currently amended): The transportable heat storage unit according to Claim 11, wherein in said heat storage body, ~~a~~ said second supply pipe surrounds at least a part of said first supply pipe having said discharge holes and has a communicating portion that guides said heat exchange medium to said discharge holes.

13. (Currently amended): The transportable heat storage unit according to Claim 11, wherein a switching valve for switching supply and cutoff of said heat exchange medium depending on the state of said heat storage body is provided severally for said first and second supply pipes.

14. (Currently amended): The transportable heat storage unit according to Claim 11, wherein ~~said supply pipe or~~ at least a part of said first supply pipe extends in a horizontal direction, and
said discharge holes are provided for an area extending in the horizontal direction such that the holes are open in a vertically downward direction.

15. (Currently amended): The transportable heat storage unit according to Claim 11, wherein in said heat storage body, said supply pipe or said first supply pipe has an expanded portion that is in a shape that widens toward an end and provided with said discharge holes on a bottom surface.

16. Canceled.

17. (Currently amended): The transportable heat storage unit according to Claim 11, wherein wave-absorbing plates that are arranged in parallel with each other along the ~~boundary surface phase boundary~~ between said heat storage body and said heat exchange medium and arranged vertically to said ~~boundary surface phase boundary~~, and prevents agitation on said ~~boundary surface phase boundary~~.

18. (Currently amended): The transportable heat storage unit according to Claim 11, wherein said discharge pipe includes a separation mechanism that separates said heat storage body and said heat exchange medium.

19. (Currently amended): The transportable heat storage unit according to Claim 18, wherein said separation mechanism has a separator for allowing said heat exchange medium and said heat storage body, which were taken in, to flow horizontally in one direction and a discharge hole that discharges said heat storage body, which is being precipitated, from said separator, and
said separator has a shape for guiding said precipitated heat storage body toward said discharge hole.

20. (Currently amended): The transportable heat storage unit according to Claim 11, wherein said heat storage body is erythritol.

21. (Currently amended): A transportable heat storage unit, comprising:

a transportable host storage container that houses a heat storage body, which stores heat by a change in state change from a solid state to a liquid state, and a heat exchange medium, which exchanges heat by directly contacting said heat storage body, has a smaller specific gravity than that of said heat storage body when said heat storage body is in said solid state, and is separated by phase from said heat storage body when said heat storage body is in said solid state;

a supply pipe that passes through at least said heat storage body housed in said storage container when said heat storage body is in said solid state and feeds supplies and releases said heat exchange medium into said storage container; and

a discharge pipe that discharges said heat exchange medium housed in said storage container to the outside of said storage container, wherein said supply pipe includes:

a first supply pipe having an outlet that discharges said supplied heat exchange medium into said heat exchange medium housed in said storage container; and

a second supply pipe that has at least a part of said first supply pipe inside the pipe and has discharge holes that discharge said supplied heat exchange medium into said heat storage body,

~~wherein a first connection port of said supply pipe is positioned above a second connection port of said discharge pipe, and~~

~~wherein the first connection port and the second connection port are configured to connect the heat storage unit with a heat exchanger.~~

22. (Currently amended): The transportable heat storage unit according to Claim 21, wherein in the case where said supply pipes are provided parallelly in said heat storage body, a thermal conduction member for conducting heat of said supply pipes is provided.

23. (Currently amended): The transportable heat storage unit according to Claim 22, wherein at least a part of said supply pipe is provided on the bottom surface of said storage container.

24. (Currently amended): The transportable heat storage unit according to Claim 21, wherein said second supply pipe is provided on the bottom surface of said storage container so as to cover said bottom surface.

25. Canceled.

26. (Currently amended): The heat storage unit according to Claim 21, comprising:
~~wave-absorbing plates that are parallelly arranged with each other along the boundary surface phase boundary between said heat storage body and said heat exchange medium and arranged vertically to have a portion of at least one of said wave-absorbing plates crossing said with respect to said boundary surface phase boundary, and prevents agitation on said boundary surface.~~

27. (Currently amended): The transportable heat storage unit according to Claim 21, wherein said discharge pipe includes a separation mechanism that separates said heat storage body and said heat exchange medium.

28. (Currently amended): The transportable heat storage unit according to Claim 27, wherein said separation mechanism has a separator for allowing said heat exchange medium and said heat storage body, which were taken in, to flow horizontally in one direction and a

discharge hole that discharges said heat storage body, which is being precipitated, from said separator, and

 said separator has a shape for guiding said precipitated heat storage body toward said discharge hole.

29. (Currently amended): The transportable heat storage unit according to Claim 21, wherein said heat storage body is erythritol.